

In re Patent Application of:

PHILLIPS ET AL.

Serial No. **10/705,610**

Filed: **November 10, 2003**

Remarks

Claims 1-36 are pending in this application.

Claims 1-12, 14-15, and 26-27 have been rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The phrase "optical interference pattern comprises microstructures having dimensions..." recited in the claims is said to be confusing and indefinite, since it is not clear what is considered to be "microstructures".

The applicant has amended claim 1 to define the first surface as having microstructures having dimensions from about 0.1 to 10 microns, wherein the microstructures form an optical interference pattern; by way of example, an interference pattern such as a diffraction grating or hologram.

Within the instant specification, the following supporting text is found:

"The particular methods and structures that form optical interference pattern 14 are known by those skilled in the art. For example, embossing the light transmissive substrate to form an interference pattern such as a hologram thereon can be done by well known methods, such as embossing the surface of a plastic film by pressing it in contact with a heated nickel embossing shim at high pressure." (underlining added)

The structures referred to in the paragraph above are microstructures having the dimensions in the range claimed and can define holograms or the like by, for example, embossing.

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Amended claim 1 now defines:

1. A security article, comprising:

(a) a light transmissive substrate having a first surface and an opposing second surface, the first surface ~~having an optical interference pattern associated therewith, said optical interference pattern~~ comprises microstructures having dimensions in the range from about 0.1 microns to about 10 microns forming an optical interference pattern; and,

(b) a color shifting multilayer optical coating overlying the second surface of the substrate.

The examiner has pointed out that it is not clear what is considered to be these microstructures.

Numerous examples of these microstructures forming interference patterns are given throughout the abstract, disclosure and claims as filed.

In paragraph [57] of the instant application, in the disclosure, the following description is found.

The security article 10 includes a light transmissive substrate 12 having an optical interference pattern 14 such as an embossed image on an outer first surface thereof. A color shifting optical coating 16 is formed on an opposing second surface of substrate 12 and is discussed in further detail below. The combination of substrate 12 and color shifting optical coating 16 forming security article 10 provides a security feature that reduces the possibility of duplication,

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forgery and/or counterfeiting of an object having security article 10 thereon.

Further clarification is found in paragraph [58], where it states:

"The optical interference pattern 14 formed on the outer surface of light transmissive substrate 12 can take various conventional forms including diffraction patterns such as diffraction gratings, refraction patterns, holographic patterns such as two-dimensional and three-dimensional holographic images, corner cube reflectors, Kinegram.RTM. devices (i.e., holograms with changing imagery as the angle of view is changed), Pixelgram.RTM. devices (i.e., a hologram with multiple holographic pixels arranged in a spatial orientation that generates one holographic image), zero order diffraction patterns, moire patterns, or other light interference patterns based on microstructures having dimensions in the range from about 0.1 microns to about 10 microns, preferably about 0.1 microns to about 1 micron, and various combinations of the above such as hologram/grating images, or other like interference patterns." (underlining added for emphasis)

Therefore the interference pattern 14 is a structure or microstructure such as a diffraction grating or hologram which could yield a holographic image or light interference pattern when light is incident upon it.

Claims 1-2, 5, 7-12, 13-15, 18, 20-24, 25-27, 30, and 32-36 are rejected under 35 U.S.C. § 103 (a) as being

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unpatentable over U.S. patent number 5,700,550 issued to Uyama et al.

The examiner says that Uyama teaches a transparent hologram seal that can be applied as a security article, wherein the hologram seal comprises a transparent base layer, (2 Figure 1) serves as the transmissive substrate having the first and second surface, a hologram forming layer 4, having a hologram, which essentially is an interference pattern, recorded therein, forming on one of the surface of the base or substrate and a multilayered evaporation coating layer 10. The evaporation coating layer is comprised of alternatively arranged high and low refractive index layers such that it changes color as light either transmits or reflects through the layer when the viewing angle is changed. The multilayer evaporation layer serves as the color shifting multilayer optical coating. (Figure 6, col. 5-6)

This reference is said to meet all of the limitations of the claim with the exception that it teaches that the hologram layer is formed on the first surface of the base layer and the color shifting coating layer is formed on the hologram layer.

As the examiner points out, it does not teach that the color shifting coating layer is formed on the second surface of the substrate, opposite to the first surface (where the hologram layer is formed).

The examiner also makes note that the position of the color shifting coating layer with respect to the base layer does not change or affect the color shifting property.

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The applicant cannot find any such teaching in Uyama that states that the position the position of the color shifting coating layer with respect to the base layer does not change or affect the color shifting property.

Furthermore, if such teaching were in Uyama, the applicant does not understand how it relates to the invention defined in the instant rejected claim 1 which defines a structure which by definition has a space between the hologram or interference microstructure and the color shifting coating.

The examiner states that Uyama teaches explicitly that the color shifting coating layer will behave the same.

The applicant does not understand the meaning of this statement; more particularly what the behavior would be the same as?

The Examiner further states that the same implies: namely changes the color of appearance for either transmitted or reflected light rays when the viewing angle is changed. (Col 6 lines 25-29).

The text from col. 6 lines 25-29, of Uyama is copied below:

"The optical path length in the transparent evaporated layer 10 is changed if an angle at which it is viewed is changed when a visible light ray of specified wavelength range is transmitted or reflected, and the transmission light or reflected light is observed as a light of different color"

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The applicant fails to see the relevancy of this passage which merely states that as the optical path length changes from the viewer's perspective, whether in transmission or reflection, an observable color shift occurs. Of course this is the basis of color shifting multilayer films.

As noted above, the examiner points out that the position of the color shifting coating layer with respect to the base layer does not change or affect the color shifting property.

The applicant is somewhat confounded by this statement and it's relevance to the claim of the instant invention.

Firstly it is not clear to the applicant what said base layer is.

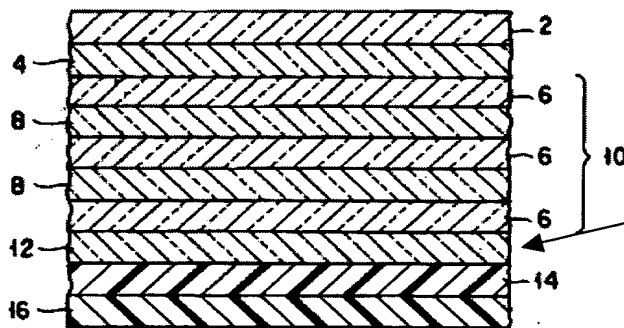
A base member 2 is shown by Uyama.

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Hologram layer 4 is shown sandwiched between base layer 2 and the color shifting coating 10 and being directly adjacent to 10.

FIG. 1

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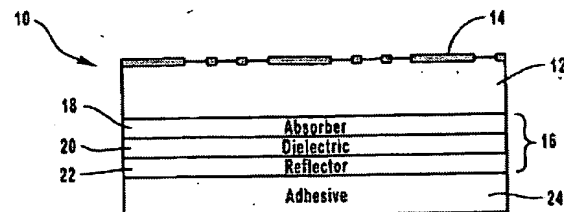


Fig. 1

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The applicant has defined a structure wherein the microstructural interference pattern 14 is disposed (a predetermined distance) on the other side of the substrate from color shifting multilayer optical coating overlying the second surface of the substrate.

Uyama doesn't teach or suggest this and certainly doesn't teach that doing this or not doing this is the "same", as the examiner suggests.

It should be clearly understood, putting the interference structure on the same or different sides of the substrate is "not the same" and does not have the same effect.

There is a significant and unexpected advantage to having this predetermined separation between the microstructure interference pattern and the color shifting coating; it ensures that the color of the hologram will be "true", and not a result of significant interference between the hologram or microstructural interference pattern with the color shifting coating. In contrast, the cited Uyama reference places a hologram directly on the color shifting coating. The applicant's structure having the hologram or interference pattern on the first side of the light transmissive substrate with the color shifting coating on the second side, essentially provides a buffer between the color shifting coating and the interference pattern to obviate or lessen any interaction between the layers. The physical effect of this is a hologram resulting in a more "true" color and an optical effect wherein the hologram seems to be floating on or above it's background. The resulting image appears to allow the

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viewer to look behind or around the hologram. The structure taught by Uyama simply doesn't provide these advantages.

The examiner states that to place the color shifting coating at the substrate surface opposite to the hologram forming layer or on the same side and on the hologram forming layer will not affect the color shifting coating to the hologram seal.

Firstly, this is simply not taught or suggested by Uyama, and is the examiner's hindsight construction. Uyama makes "no" mention of alternatives such as placing the two on opposite sides, and makes no mention of the affect of doing so with respect to the color shifting properties and more importantly to the visual results of viewing the hologram.

The examiner states that one skilled in the art would be motivated to separate the hologram forming layer from the color shifting layer to avoid possible interference between the hologram layer and the color shifting layer and therefore avoid noise.

The term "noise" which the examiner refers to, simply does not appear in the Uyama reference.

Furthermore, Uyama never suggested this, nor has it been suggested in any other references. It was the applicant's discovery that this would yield substantial benefits. These benefits are afforded from the applicant's invention.

A hologram which preserves its integrity in the presence of a thin film color shifting coating is provided by the

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instant invention as defined in claim 1. This has advantages over all of the structures proposed by Uyama.

Because the instant invention requires placing the interference filter such a hologram on the opposite side of the substrate from the color shifting filter a different optical effect is achieved than placing it on the same side with the hologram. The thickness of the substrate for example PET, typically of 12 to 25 microns, is sufficiently thick that one can see "under" ie "around and under" the hologram to view the color shifting filter. This parallax advantageously gives the hologram an appearance of floating over a background of a color shifting coating that one does not have if both hologram and thin film filter are on the same side of the PET substrate.

Thus, it is not obvious from Uyama that such an effect would be possible just on design consideration alone. There is no teaching or suggestion of doing this. In fact there is explicit teaching away from such a structure.

For the reasons given above, claims 2-12, dependent on claim 1 are believed to be patentable, importing the novelty and invention of amended claim 1.

The parent US patent 6,761,959 from which this divisional application claims priority, issued and the examiner's reasons for allowance are as follows.

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REASONS FOR ALLOWANCE

7. The following is an examiner's statement of reasons for allowance:

The prior art fails to teach or suggest the recited security article. The structural limitations that overcome the prior art of record include a security article comprising a light transmissive substrate having a first surface and an opposing second surface, the first surface having a diffraction grating pattern or a holographic image pattern and a color shifting multiplayer optical film on the second surface of the substrate, the optical film comprising an absorber layer on the second surface of the substrate, a dielectric layer on the absorber layer, and a reflector layer on the dielectric layer. The optical film provides an observable discrete color shift such that the article has a first background color at a first angle of incident light or viewing and a second background color different from the first background color at a second angle of incident light or viewing, the article exhibiting an optical diffraction grating pattern effect or a holographic image pattern in addition to the first and second background colors.

It should be noted that Uyama et al was cited against the claims of this now issued parent patent US 6,761,959; however the examiner's reasons for allowance indicate that a security article with a diffraction grating pattern or holographic image on a first surface of a substrate and a optical film that provides a color shift on a second surface of the same substrate wherein the optical film provides an observable discrete color shift such that the article has a first background color at a first angle of incidence and a second background color at a second angle of incidence, the article exhibiting an optical diffraction grating pattern effect or holographic image pattern in addition to the first and second background colors is patentable.

Claim 13 defines:

13. A security article comprising:

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(a) a light transmissive substrate having a first surface and an opposing second surface, the first surface having an optical interference pattern associated therewith;
(b) a color shifting multilayer optical coating overlying the second surface of the substrate; and (c) a laser ablated image formed in said optical coating.

The examiner states that Uyama teaches that the hologram seal may include a print layer (28) with desired character... and that the print layer 28 may be formed by conventionally known printing methods or coating methods such as gravure printing method. The examiner then uses as an example by indicating (i.e. some kind of etching method). The examiner then states that since laser etching is known, that Uyama teaches or is suggestive of laser ablation.

The applicant respectfully disagrees on this point. Claim 13 defines the step of ablating an image formed in the coating. Ablating is the process of removal of material - a subtraction; printing is the process of addition of material, i.e. addition of an ink or fluid. Therefore Uyama's teaching of printing is a teaching of addition of material; and as the examiner points out, this may be done by inking an etched plate and adding ink to the security device, not by removing material.

In summary, claim 13 and all claims dependent thereon are believed to be patentable.

Uyama doesn't teach A security article comprising:
(a) a light transmissive substrate having a first surface and an opposing second surface, the first surface having an optical interference pattern associated therewith; and

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(b) a color shifting multilayer optical coating overlying the second surface of the substrate;

Furthermore, Uyama doesn't teach the last limitation in the claim;

(c) a laser ablated image formed in said optical coating.

The examiner's rejection of the claims dependent on claims 1 and 13 are believed to be moot in view of the patentability of these two independent claims, and the applicant respectfully submits that all claims 1 through 24 are patentable.

Claim 25 has been rejected.

Claim 25 defines a security article comprising:

- a) a light transmissive substrate having a first surface and an opposing second surface, the first surface having an optical interference pattern associated therewith; and
- (b) a color shifting multilayer optical coating overlying the second surface of the substrate, and
- (c) an adhesive layer laminating said optical coating to said second surface.

For the reasons given above, for claims 1 and 13, the applicant is of the view that claim 25 is also patentable. Further still, claim 25 defines an adhesive laminating layer not found in combination with the substrate as defined and the color shifting coating as defined.

Claims 1, 13, and 25 are consistent with the claim and reasons for allowance given in the parent application.

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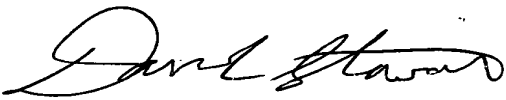
Applicant has provided terminal disclaimers with respect to the three applications cited as the basis for the obviousness-type double patenting rejections.

In view of the foregoing, it is respectfully submitted that all of the claims remaining in the application are in condition for allowance. Early and favorable consideration would be appreciated.

Should any minor informalities need to be addressed, the Examiner is encouraged to contact the undersigned attorney at the telephone number listed below.

Please charge any shortage in fees due in connection with the filing of this paper, including Extension of Time fees, to Deposit Account No. 50-1465 and please credit any excess fees to such deposit account.

Respectfully submitted,


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